Accessible Health Information in the Digital Age:
A Systematic Analysis of Online Federal Resources for Secondary Health Conditions Common in Adults with Developmental Disabilities

Honors Research Thesis

Presented in partial fulfillment of the requirements for graduation with *honors research distinction* in the undergraduate colleges of The Ohio State University

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March 2014

Introduction

Currently in the United States, there are more than 4.6 million individuals with an intellectual and/or developmental disability (I/DD). This population is incredibly diverse with a myriad of complex health needs. According to the *Surgeon General's Call to Action to Improve the Health and Wellness of Persons with Disabilities* (2005), there is a public health crisis occurring among Americans who identify as disabled. In particular, the population with I/DD has both a significantly increased risk of secondary health conditions such as mental health problems, oral health issues and obesity, and decreased access to health promotion and education programs. As defined by Seekins, et al (1991), secondary health conditions are any "health problems that are preventable and occur after the primary impairment or disability." Turk (2006) refined the definition by addressing commonalities across various definitional sources, including that a secondary condition is "preventable, varying in how and when [it is] expressed, and [has] the potential to increase the severity of the primary disability." A recent study found that at any given time, an individual with I/DD is experiencing an average of 11.3 secondary conditions, and nearly half the participants surveyed viewed their own health as fair to poor for their overall independence (Koritsas & Iacono, 2011). Furthermore, reports show that simple health promotion regarding the preventable conditions that often accompany a developmental disability could drastically reduce this health disparity (Doody & Doody, 2012).

With the dawn of the Internet age, many health promotion programs have transitioned from in-person interventions to online resources and information dissemination. As technology becomes ubiquitous in the United States it is becoming

simpler than ever for millions of Americans to access healthcare information in new ways. Nearly 74% of adults in North America use the Internet regularly, and among those, 79% have searched for health topics and information regularly (Internet World Stats, 2009; Evers, 2006). A plethora of resources regarding health, illness, support, and healthcare rights and responsibilities have been developed and implemented online in the hopes of reaching more Americans than ever before. For the purposes of this study, the resources being analyzed are those produced and disseminated by the United States federal government, recognizable by the characteristic ".gov" at the end of the web address. The accessibility of these resources for individuals with I/DD is not well studied, and therefore the organizations and governmental departments funding these programs may be entirely missing a huge population in need of their support. Understanding the accessibility of these online resources is crucial for the development or modification of preventative programs, which will in turn reduce health costs associated with individuals with developmental disabilities. The cost of modifying and maintaining preventative online health resources would be drastically lower than the cost of care for the secondary conditions currently plaguing this population. Therefore, it is essential to establish a baseline understanding of the current state of online preventative resources in order to identify where changes need to be made.

The meaning of accessibility can vary across context, and so it is necessary to define the term in regards to this research. Technological accessibility can refer to the compatibility of assistive technology, the usability of resources, and the availability of content in multiple formats. Accessibility, however, may also refer to the content itself. This aspect refers to readability, or ease of comprehension, and reading level (Singh, et

al, 2009). The World Wide Web Consortium (W3C) suggests that content be written at an early secondary education level, although the accepted reading level of the typical population is only 8th grade (W3C, 2008; NCDDR, 2003). For content accessible for individuals with cognitive impairments, a 4th or 5th grade reading level is preferred (NCDDR, 2013). While readability, accessibility of content, and the use of technical language are most likely barriers to access for individuals with I/DD attempting to access online health promotion resources, measurements of these factors are beyond the scope of this discussion. Therefore, this research will focus on technological accessibility.

To determine the accessibility of these resources, it is important to understand the technologies and software implemented by individuals with I/DD in order to accommodate their increased needs.. An individual in need of assistive technology may use several options that require special consideration when developing online resources. Screen reader software, which produces audio reflecting what is written on the screen, is widely available and used frequently for individuals who are illiterate, have cognitive impairments, or are vision-impaired. Similarly, Refreshable Braille displays render text on screen as Braille on a keyboard (Mates, Wakefield, & Dixon, 2000). Both of these technologies require specific coding and care not to create redundant or confusing links, text, and images in order to perform optimally. Additionally, individuals who key rather than using a traditional mouse require specific accommodations including the option to skip navigation to the main content of the page, among other needs (Mates, Wakefield, & Dixon, 2000). Many individuals with I/DD also require assistance such as the option to magnify text and images, large text and links, and visual text to accompany audio (Mates, Wakefield, & Dixon, 2000) This research primarily focused on the coding and structural

elements of online resources, and so screen readers, Braille displays, and other software whose functionality depends of concise, clear coding that is not redundant, misleading, outdated, or structurally unsound are most relevant.

The following analysis also uses some common terms used to describe the population with I/DD, and their meanings as determined by law are found below:

-*Disability:* Under ADA, an individual with a disability is a person who: (1) has a physical or mental impairment that substantially limits one or more major life activities; OR (2) has a record of such an impairment; OR (3) is regarded as having such an impairment. (42 U.S. Code § 12101)

-*Developmental Disability:* According to the Developmental Disabilities Assistance and Bill of Rights Act **(**42 U.S.C. §6000 et seq.) the term "developmental disability" means a severe, chronic disability of an individual that:

(i) is attributable to a mental or physical impairment or combination of mental and physical impairments;

(ii) is manifested before the individual attains age 22;

(iii) is likely to continue indefinitely;

(iv) results in substantial functional limitations in 3 or more of the following areas of major life activity:

(I) Self-care.

(II) Receptive and expressive language.

(III) Learning.

(IV) Mobility.

(V) Self-direction.

(VI) Capacity for independent living.

(VII) Economic self-sufficiency; and

(v) reflects the individual's need for a combination and sequence of special, interdisciplinary, or generic services, individualized supports, or other forms of assistance that are of lifelong or extended duration and are individually planned and coordinated.

-*Intellectual Disability:* The Individuals with Disabilities Education Act (IDEA) cites that intellectual disability means significantly sub average general intellectual functioning, existing concurrently [at the same time] with deficits in adaptive behavior and manifested during the developmental period, that adversely affects a child's educational performance. (20 U.S.C. § 1400)

Research Design

The following paper seeks to explore the accessibility of online resources for preventable health conditions common to people with developmental disabilities. To accomplish these ends, a literature review will be conducted in order to identify major secondary conditions among the adult population with I/DD. Conditions will be chosen based on health concerns as outlined by the federal government, and then verified via various peer-reviewed materials. Next, online resources addressing each condition will be identified. These resources will be government-sponsored programs with explicitly stated accessibility policies. Section 508 of the Rehabilitation Act states that Federal agencies and services must make electronic and information technology accessible to individuals with disabilities (29 U.S. Code § 794d). Because the federal government has already outlined measures to ensure accessibility, federally run sites (those featuring ".gov") should have these accessibility measures in place. Furthermore, these sites will also be

measured against the World Wide Web Consortium (W3C)'s Web Content Accessibility Guidelines (WCAG) as established by the Web Accessibility Initiative. There are three levels of compliance, the first articulated as guidelines that *must* be followed for accessibility, the second guidelines that *should* be followed, and the third tier as guidelines that *may* be followed at the developer's discretion (W3, 2013). Unlike Section 508, there is no direct legal ramification for not complying with WCAG, although it opens up one's organization to a lawsuit for discrimination. Therefore, Section 508 stands as the bare requirement for accessibility, and the three tiers of WCAG act as the "best practices" for online accessibility.

Several accessibility tests will be administered, including a freely available accessibility evaluation (WAVE web accessibility evaluation tool), and the Functional Accessibility Evaluator developed by the University of Illinois Urbana-Champaign. The WAVE, developed in 2001 with sponsorship from the Office of Special Education and Rehabilitative Services (US Department of Education) and the Temple University Institute on Disabilities, can evaluate a single page and identifies both errors in accessibility such as skipped heading levels as well as alerts such as duplicated embedded links, and will be applied to the home page of the resources identified (WebAIM, 2013). The report is extremely thorough, displaying where errors appear on the page as well as displaying total errors. The FAE tool, developed and currently in use by the University of Illinois at Urbana-Champaign, evaluates web content based on Section 508, the WCAG, and an Illinois accessibility law (University of Illinois, 2014). The tool can evaluate up to three levels of domains, meaning that it inspects the page, all pages linked, and then all pages linked on those second-tier domains. The results are compiled into a report stating

the percentage of content that passed inspection based on five subcategories. Additionally, measurements regarding the frequency of the words “disability,” “developmental disability,” and “intellectual disability” will be taken in order to assess the specificity and sensitivity to the needs of this population on each site. These terms move from broad (“disability”) to narrow (“intellectual disability”), and so measure sensitivity at different levels. A search will be down with each term in quotation marks, and the number of results will serve as an indicator of the occurrence of I/DD-specific material on each resource. For pages that occur within larger web resources, a search containing the subject of interest and the term of interest will be used (example: “oral health” “developmental disability”).

It is anticipated that there will be accessibility issues regarding all resources examined. Were these resources to increase in accessibility, individuals with disabilities may utilize them more readily, thus potentially limiting many of the secondary conditions that shorten lifespan and decrease quality of life.

Results and Analysis

The following data is separated into two distinct sections based on the research question. First, it was necessary to determine the secondary health conditions deemed most significant for individuals with developmental disabilities. A literature review of preventable secondary health conditions for individuals with I/DD was conducted, and the results are summarized below. The major topics addressed in this paper are gleaned from the Healthy People 2010 report produced by the Office of Disease Prevention and Health Promotion. The report, which states the narrowing of the health disparity via reduction of secondary conditions in adults with I/DD as one of its major goals,

articulates ten public health concerns for the decade (HP2010, 2000, II, p. 6.3). These concerns are measured by ten indicators of health, being "physical activity, [weight], tobacco use, substance abuse, responsible sexual behavior, mental health, injury and violence, environmental quality, immunization and access to healthcare" (Rurangirwa, Braun, Schendel & Yeargin-Allsopp, 2006). Therefore, the issues encountered in the community with I/DD would be lack of physical activity, obesity, tobacco use, substance abuse, lack of reproductive healthcare, mental health issues, injury and violence, health issues due to unsafe environments, and barriers to healthcare access. To measure the impact of each of these factors on adults with I/DD, a review of the literature was conducted and summarized below.

Literature Review

Physical Activity. Several studies over the last fifteen years exploring what issues adults with I/DD find most troublesome consistently report lack of physical activity, difficulty exercising, and conditioning problems as an area of concern. Traci, Seekins, Szalda-Petree, & Ravesloot (2002) report that 53% of a representative population of adults with I/DD claim physical fitness to be a difficulty in their lives. A similar study conducted in 2011 across 659 individuals with I/DD claims that percentage to be closer to 65% (Koritsas & Iacono). A study conducted in North Carolina comparing the behavioral risk factors of adult with I/DD to that of the general population found that 33% of adults with I/DD had not exercised in the past month, as opposed to 22% of the general population (Havercamp, Scanlin, & Roth, 2004). The CDC has released a study

stating that 25.6% of the 50 million adults with disabilities—including those with developmental disabilities—report themselves as "physically inactive," as opposed to only 12.8% of adults without disabilities (CDC, 2005). Because of the prevalence of physical inactivity, the stated concern by adults with I/DD, and the governmental commitment to improving the physical activity of adults with disabilities, the accessibility of *www.fitness.gov,* the major federal online resource for physical activity and information dissemination regarding fitness was examined.

Obesity and Nutrition. Obesity and weight-related issues, including diabetes, have been and continue to be a significant issue for adults with I/DD. The CDC's *Healthy People Progress Report* (2012) claims that 45% of men and 56% of women with developmental disabilities are likely to be obese. Stanish and Draheim (2007) posit that nearly 80% of adults with mild to moderate I/DD who reside in community settings with less direct supervision than institutional settings tend to be overweight or obese. They further state that 45% of these individuals are obese (BMI $\leq$ 30 kg/m^2), and 8% are morbidly obese (BMI $\leq$ 35 kg/m^2) (Stanish & Draheim, 2002; WHO, 2013). In comparison, 35.7% of the general population is currently classified as obese, with 5% being morbidly obese (Ogden, Carroll, Kit, & Flegal, 2012). When interviewing adults with I/DD directly about health concerns, responses range from 44-60% of respondees citing weight as a concern (Traci, Seekins, Szalda-Petree, & Ravesloot, 2002; Koritsas & Iacono, 2011). The consequences of chronic obesity are numerous, including increased risk of heart disease, stroke, type 2 diabetes, liver disease, sleep apnea, and osteoarthritis (CDC, 2011). Online resources such as *www.choosemyplate.gov* are being used as a

means to increase nutrition education, decrease obesity, and subsequently lower the health costs associated with overweight individuals. Because obesity disproportionately affects individuals with developmental disabilities, these consequences in turn also affect the population in greater numbers. Therefore, the resources designed to address these issues must be accessible to the population most affected.

Oral Hygiene. Over the last decade, research has continually pointed to oral health as an indicator of overall health. "A growing body of evidence has linked oral health, particularly periodontal (gum) disease, to several chronic diseases, including diabetes, heart disease…stroke…[and] has also been associated with premature births and low birth weight." (HP2020, 2013). Haverman, et al (2010) cite oral health as one of the top ten secondary conditions causing limitations in activities of daily living (ADLs) in adults with I/DD (p. 62). When surveyed, 56% of individuals with I/DD are concerned with, have problems regarding oral health (Koritsas & Iacono). At study of nearly 5,000 individuals with I/DD showed that, even when receiving dental care from a state program, 32.2% of cavities, and 80.3% of cases of periodontitis went untreated (Morgan, Minihan, Stark, Finkelman, Yantsides, Park, Nobles, Tao, & Must, 2012). Additionally, 14.4% of adults with I/DD have not received a teeth cleaning in the last five years, as opposed to 8.0% of individuals with no disabilities (Havercamp, Scanlin, & Roth, 2004, p. 423). When surveyed, 56% of adults with I/DD cite oral hygiene issues as problematic or barriers to health (Koristas & Iacono, 2011). The disparity in oral care and the majority of adults with I/DD naming oral hygiene as an area of concern suggests that accessible resources may be of great benefit to this population. The federal government does not

have website devoted solely to oral health, and so the CDC resources found at *www.cdc.gov/oralhealth* will be evaluated.

Reproductive Health. The "tendency to 'desexualize' or downplay the sexuality of young adults with developmental disabilities has increased the health risks of this population by limiting their access to sexual health information, reproductive healthcare, and counseling" (Deschaine, 2011). The lack of education about reproductive health, and particularly women's health among this population is staggering. The asexualization of adults with developmental disabilities has led to a systematic exclusion from reproductive healthcare practices. For example, nearly 11% of adult women with I/DD have never had a Papanicolaou (pap) test, as opposed to just 2.2% of adult women who do not have a disability (Havercamp, Scanlin, & Roth, 2004). Similarly, 26.8% of women with I/DD over 40 have not had a mammogram, compared to just 13% of the typical population (Havercamp, Scanlin, & Roth, 2004). This disenfranchisement of adults with I/DD from reproductive care can result in the spread of STIs including HIV/AIDS, and HPV, the leading cause of cervical cancer, unwanted or unplanned pregnancy, undiagnosed ovarian cancer, and a myriad of other health issues (Fathalla, n.d; Mayo Clinic, 2014). Because the major issues regarding safe sex practices and reproductive health appear to be among women, *www.womenshelath.gov* has been analyzed to assess accessibility.

Mental Health. In recent years, the co-morbidity and predisposition for mental health disorders in individuals with I/DD has become a topic of interest. Research has established that individuals with I/DD have experienced the full spectrum of mental

health issues illustrated in the *DSM-V,* and often at much higher rates than the typical population (Ryan & Neligh, 1997). For example, individuals with an autism spectrum disorder (ASD) have a 67% chance of developing a comorbid mental health disorder (with the most common being ADHD), while only 25% of the general population will develop a mental health disorder in a given year (CARD, n.d.; NAMI, 2013). Mental health disorders occur at rates 3-6 times higher than the general population, and "men and women with developmental disabilities are known to have significantly less social support than people in the general population. The absence of social support has been found to correlate with poorer quality of life and mental health problems (Eaton & Menolascino, 1982; Core Indicators Report, 2002). Between 34-49% of adults with I/DD complain of depression as a significant barrier to wellbeing, making it the 7th most common secondary condition for adults with I/DD (Koritsas & Iacono, 2011; Traci, Seekins, Szalda-Petree, & Ravesloot). Additionally, individuals with I/DD often have difficulty in the identification and treatment for mental health issues due diagnostic-overshadowing—the "tendency for clinicians to attribute symptoms or behaviours of a person with learning disability to their underlying cognitive deficits and hence to under-diagnose the presence of co-morbid psychopathology" (Reiss, Levitan, & Szyszko, 1982). Therefore, it is not only important for adults with I/DD to understand what mental health is, but also to understand their rights and participation in the mental health system. Issues such as these are currently being addressed in online resources, but the capability of individuals with I/DD to access them has not been assessed. Thus, the online resource *www.mentalhealth.gov* has been analyzed for accessibility.

Tobacco Use. Tobacco use, which continues to be a public health crisis for the entire population, is responsible for one in every five deaths in the United States (CDC Mortality Weekly Report, 2013). Tobacco-related illnesses include but are not limited to coronary heart disease, lung and throat cancer, cardiovascular disease, and stroke (USDHHS, 2014). While a slightly smaller percentage of the population with I/DD smokes than the typical population—between 17.8-24.0% of the population with I/DD as opposed to 24.8-31.7% of the typical population—the population with I/DD faces increased risk of tobacco-related health and safety issues (Rurwangira, Braun, Schendel, & Yeargin-Allsopp, 2006; Havercamp, Scanlin, & Roth, 2004; Steinberg, Heimlich, & Williams, 2009). Steinberg, et al (2009), claim that because individuals with I/DD are more likely to be impoverished, they are more susceptible to experiencing financial burden due to tobacco use. Tobacco products may also reduce the effectiveness of medication often prescribed to this population as well (Steinberg, Heimlich, & Williams, 2006). Finally, and most relevantly for this study, even if an individual with a disability manages to gain access to a tobacco cessation program, they are often unsuccessful due to lack of accessibility (Steinberg, Heimlich, & Williams, 2009). The federal government has launched an online resource at *www.smokefree.com* with the express purpose of encouraging tobacco cessation, particularly among vulnerable populations. It is therefore imperative that this resource be accessible to this particular vulnerable population.

Substance Abuse. Substance abuse, including alcohol, prescription medication, and illicit drug misuse, is an often overlooked issue in individuals with I/DD. Similar to tobacco use, a smaller percentage of individuals with I/DD abuse substances when

compared to their typical counterparts, but the population is still considered particularly vulnerable (Rurangirwa, Braun, Schendel, & Yeargin-Allsop, 2006). A survey of health risk indicators revealed that 25.1% of individuals with a cognitive impairment, and 17.8% of individuals with multiple disabilities drank alcohol in the past month, as opposed to 63.9% of the general population (Rurangirwa, Braun, Schendel, & Yeargin-Allsop, 2006). Despite the difference in usage, Christian & Poling (1997), cite a lack of "self-regulatory behaviors," possibly stemming from a lack of appropriate education regarding substance abuse, make the population with I/DD particularly vulnerable to the negative side-effects of drug and alcohol use. While addiction services are required under the Americans with Disabilities Act (ADA) to accommodate individuals with I/DD within reason, "few programs have taken the time and resources necessary to modify their services to ensure cognitive accessibility. Addiction prevention, treatment and recovery services tend to rely heavily on abstract terminology laden with nuanced meaning" (Miranda, 2013). The lack of access to addiction services and information continues to put the population with I/DD at risk for substance abuse and related health issues. The National Institute on Drug Abuse has created an online resource for information and support at *www.drugabuse.gov*, and this is the resource analyzed for this study.

Injury and Violence. Individuals with I/DD are disproportionately-often the victims of violence and violent crimes. Wilson and Brewer (1992) found that persons with I/DD are 12.8 times more likely to be robbed, 10.7 times more likely to be sexually assaulted, and 2.8 times more likely to be nonsexually assaulted than the typical

population. Additionally, 40% of violent crimes against people with a mild cognitive impairment and 71% of violent crimes against individuals with a severe cognitive impairment went unreported (Wilson & Brewer, 1992). The CDC's major campaigns to preventing injury focus on child abuse, sexual violence, intimate partner violence, and suicide, all of which (with the exception of suicide) occur at disproportionately high rates among individuals with developmental disabilities (CDC Violence Prevention, 2014; Wilson & Brewer, 1992). Rurangirwa, et al (2006) found that 7.3% of individuals with a cognitive impairment had been assaulted in the last year, as compared to only 1.6% of the general population. Education regarding violence prevention, personal rights, and general safety may exponentially reduce the prevalence of violence in this population. The CDC sponsors an online resources outlining violence and injury prevention measures at *www.cdc.gov/injury*. This resource has been evaluated for the purposes of this study.

Environmental Quality. Increasingly, the effect of the environment on human health has become a topic of importance in public health. Currently, nearly a quarter of deaths and the burden of disease can be attributed to environmental factors (Prüss-Üstün & Corvalán, 2006). Poor air quality can increase one's risk of cancer, long-term damage to respiratory and cardiovascular systems, and premature death, and poor water quality has been linked to gastrointestinal and neurological illnesses (HP2020, 2013). While there is not a wide breadth of research performed on the vulnerabilities of individuals with I/DD regarding environmental hazards, they are recognized as an "at-risk" population in poor air quality conditions (Davis, 2009). "Neurotoxicants such as lead, mercury, carbon monoxide, and pesticides in the home environment are of particular

concern for those living with a cognitive, intellectual, or developmental disability because exposure to these chemicals can affect the central nervous system" (Lanphear, et al, 2005). The Environmental Protection Agency sponsors an online resource addressing health concerns raised by environmental hazards. This resource, found at *www2.epa.gov/learn-issues/learn-about-health-and-safety* (heretofore referred to as *epa.gov*) has been analyzed for accessibility.

Access to Healthcare. In a series of stakeholder interviews conducted in 2008 by Harder and Company, words and phrases used to describe the healthcare system for adults with I/DD included "nonexistent," "wasteful," "traumatic," "dangerous," "widespread medical neglect," and "dramatic health care disparities that are unconscionable in this country." The inability for adults with I/DD to access appropriate care often stems from an inability to adequately finance health care. The physicians willing to see individuals on Medicaid often lack the resources, tools, and training to treat individuals with I/DD, leaving illness unrecognized, misdiagnosed, or undertreated (Harder and Company, 2008). A recent research project in Massachusetts found that issues often involve a shortage of professionals willing to accept public health insurance, a lack of adequate coverage, and a lack of knowledge regarding the health care system (Barrepski, 2009). The major online resource for healthcare coverage and information is *www.healthcare.gov.* Due to the new penalties associated with lack of healthcare coverage, it is imperative that individuals with I/DD be able to access the information provided on this website, leading to the choice to analyze it's accessibility for this study.

Accessibility Analysis

Web Accessibility Evaluation Tool. The Web Accessibility Evaluation Tool (WAVE) was used on the homepage of each website. Homepage, in this context, refers to the page that is called up when the addresses cited above are entered (not necessarily the domain's homepage). The WAVE tool identifies accessibility "errors", which refer to inherent flaws that impair accessibility and accessibility-related equipment such as screen-readers, whereas "alerts" are structural elements that may or may not impair accessibility and require human evaluation. Across all ten webpages (each of which features an accessibility statement articulating commitment to Section 508), twenty-nine (29) errors and two hundred and twenty (220) alerts were detected (See Table 1). Four of the ten pages—*fitness.gov, smokefree.gov, cdc.gov/injury,* and *epa.gov/learn-issues/learn-about-health-and-safety* (heretofore shortened to *epa.gov)*—detected no inherent accessibility errors. *Womenshealth.gov* proved the least accessible with 12 errors on its homepage. Of the twenty-nine errors, twenty-two, or 75.8%, were attributed to "empty links" (See Table 2). An empty link, which is a link that is either invisible or can only be detected via an image, are an accessibility barrier because they can go undetected by screen-readers, can cause screen-readers to malfunction, or may accidently be triggered via keyboard commands. The second most frequent error, "linked image missing alternative text," which accounted for 10.3% (n=3) of the errors accounted for, carries similar implications regarding a screen-reader's inability to present the user with information about the link. The most frequent occurrence of these two errors occurred with social media links. As social media has become ubiquitous and the logos for the

major social media players instantly recognizable, many of these websites presented the recognizable social media icon without text. And empty button, which accounted for 6.9% (n=2) of the errors detected, is an element that, once again, bears no descriptive text for screen-readers to present to users. There was also one occurrence of a broken skip link. A skip link is an attribute devised to help keyboard users skip over navigation and jump to the page's main content, but in this case, *healthcare.gov*'s link was inactive. Finally, there was one occurrence of an empty form label, meaning that the label did not provide any information to the user about the form control. Of the six resources containing errors, *womenshealth.gov* featured the most, with twelve errors cited on its homepage. *Healthcare.gov* contained six, and the full breakdown of errors can be found in Table 3.

Table 1.
Accessibility Issues by Web Resource

Resource	Errors	Alerts
choosemyplate.gov	2	37
fitness.gov	0	7
cdc.gov/oralhealth	2	9
womenshealth.gov	12	23
mentalhealth.gov	2	16
smokefree.gov	0	67
drugabuse.gov	5	23
cdc.gov/injury	0	18
healthcare.gov	6	18
epa.gov	0	2
Total	29	220

Table 2.
Most Common Accessibility Across Resources

Warning	Frequency	Percent
Empty Link	22	75.8
Linked Image, No Alt Text	3	10.3
Empty Button	2	6.9
Empty Form Label	1	3.4
Broken Skip Link	1	3.4
Total	29	100

Table 3.
Accessibility Errors By Resource

Resource	Empty Link	Image, No Alt Text	Empty Button	Empty Label	Broken Skip Link	Total
choosemyplate.gov	1	0	1	0	0	2
cdc.gov/oralhealth	2	0	0	0	0	2
womenshealth.gov	10	1	0	1	0	12
mentalhealth.gov	0	2	0	0	0	2
drugabuse.gov	5	0	0	0	0	5
healthcare.gov	4	0	1	0	1	6

The accessibility alerts identified by WAVE numbered two hundred and twenty, and have been broken down in Table 4. The most common alert (n=80, 36.6%) was "redundant title text," meaning that the information provided by hovering over the element is the same as the text in the element itself. This redundancy may be confusing to some users, or may not provide sufficient information about the element in question. Occurring 38 times (17.2%) across all ten resources, "redundant links" were the second most common alert. A redundant link, which is any occurrence of two adjacent links leading to the same URL, can create confusion when navigating via a keyboard or with a screen-reader. When breaking down the frequency of alerts by resource, it was found that

smokefree.gov contained the most potential accessibility issues with 30.4% (n=67) of the total alerts found. *Epa.gov* contained the least alerts, with just 0.9% (n=2) of the total alerts. Table 5 outlines results for all ten resources.

Table 4.
Most Common Accessibility Alerts Across Resources

Alert	Frequency	Percent
Redundant Title Text	80	36.6
Redundant Link	38	17.2
Nearby Image, Same Alt Text	22	10.0
Missing Links to PDF	11	5.0
Skipped Heading Level	10	4.5
Other	59	26.8
Total	220	100

Table 5.
Frequency and Percentage of Alerts by Resource

Resource	Frequency	Percentage
choosemyplate.gov	37	16.8
fitness.gov	7	3.2
cdc.gov/oralhealth	9	4.1
womenshealth.gov	23	10.4
mentalhealth.gov	16	7.3
smokefree.gov	67	30.4
drugabuse.gov	23	10.4
cdc.gov/injury	18	8.2
healthcare.gov	18	8.2
epa.gov	2	0.9
Total	220	100

Functional Accessibility Evaluator. The Functional Accessibility Evaluator (FAE), an accessibility tool with the capability of assessing multiple pages under the same domain or related subdomains. For the purposes of this study, the URL of the homepage used in the WAVE evaluation was entered and a third-level evaluation was

chosen, meaning that the program examined the page entered, all pages linked in that page, and all pages linked in the second-level pages. Links were followed in both the specified domain and next level subdomains. The full reports generated and the rules summary as specified by the University of Illinois can be found in the attached appendices. The program evaluates the pages across five best practices categories, which break down further into sixteen subcategories. Each page is given a percentage reflecting how much of the content has earned a "Pass," "Warning," or "Fail" mark across these categories and subcategories. Table 6 compiles the scores of all ten resources across the main categories, which are as follows:

Navigation and Orientation: Inclusion of structural markup that facilitates navigation and contextual orientation.

Text Equivalents: Proper use of images for interoperability and the provision of text descriptions for non-text content.

Scripting: Avoidance of scripting techniques that compromise accessibility and interoperability.

Styling: Use of CSS styling techniques to separate content and structural information from styling and presentation.

HTML Standards: Support for HTML standards to improve interoperability and provide more choices in the use of technologies for rendering web content.

While the majority of the resources scored 80% or above in each category, there were some notable exceptions. *Smokefree.gov* received a 58% pass rate in the Text Equivalents

category, which, upon investigation, is due to incorrectly formatted decorative images on nearly every one of the seventy-three pages investigated. *Womenshealth.gov* received a 72% passing rate for the same reason, whereas *fitness.gov'*s 70% stems from a lack of alternative text describing images. Every resource received a 90% or above in the Scripting category, with nine of the ten receiving a 99% or above. In the category of HTML Standards (which refer to the Hypertext Markup Language guidelines established by the WCAG), *fitness.gov, healthcare.gov,* and *epa.gov* performed very poorly. In the case of *fitness.gov,* this was due to a lack of a DOCTYPE declaration, which is used to establish the version of HTML being used so that the web browser might accommodate accordingly. The other two resources failed due to a lack of character encoding, which leaves the character elements up for misinterpretation by the web browser and accessibility software.

Scores from each of the five categories were then compiled into a composite score, and the passing rate of each website according to the FAE is presented in Table 7. *Choosemyplate.gov* passed at the highest rate of 96.6%, although no resources scored a composite lower than 82.0%, which was obtained by *fitness.gov* (See Table 7). Next, scores across all resources were compiled by category, and the composite score of all ten resources for each category is presented in Table 8. Collectively, the resources performed the highest in the Scripting category, with a composite passing rate of 98.7%. The Text Equivalents category had the lowest passing rate at 80.4%. HTML Standards also had a fairly low passing rate of 82.7%.

Table 6.
FAE Accessibility Scoring by Best Practices Category

Navigation					
	Status[1]	Pass	Warning	Fail	Missing
choosemyplate.gov	Partially Implemented	86	6	7	1
fitness.gov	Almost Complete	91	4	3	2
cdc.gov/oralhealth	Almost Complete	91	3	5	1
womenshealth.gov	Partially Implemented	85	4	9	2
mentalhealth.gov	Almost Complete	89	7	2	2
smokefree.gov	Almost Complete	94	4	1	1
drugabuse.gov	Almost Complete	91	4	3	2
cdc.gov/injury	Almost Complete	91	3	5	1
healthcare.gov	Partially Implemented	86	5	8	1
epa.gov	Almost Complete	90	4	4	2
Text Equivalents					
	Status[1]	Pass	Warning	Fail	Missing
choosemyplate.gov	Almost Complete	99	0	1	0
fitness.gov	Almost Complete	70	23	5	2
cdc.gov/oralhealth	Almost Complete	79	20	1	0
womenshealth.gov	Almost Complete	72	27	1	0
mentalhealth.gov	Almost Complete	86	9	4	1
smokefree.gov	Almost Complete	58	40	1	1
drugabuse.gov	Almost Complete	85	14	0	1
cdc.gov/injury	Almost Complete	80	19	1	0
healthcare.gov	Almost Complete	96	3	0	1
epa.gov	Almost Complete	79	19	1	1
Scripting					
	Status[1]	Pass	Warning	Fail	Missing
choosemyplate.gov	Complete	100	0	0	0
fitness.gov	Complete	100	0	0	0
cdc.gov/oralhealth	Almost Complete	99	1	0	0
womenshealth.gov	Almost Complete	90	9	0	1
mentalhealth.gov	Complete	100	0	0	0
smokefree.gov	Complete	100	0	0	0
drugabuse.gov	Complete	100	0	0	0
cdc.gov/injury	Almost Complete	99	1	0	0
healthcare.gov	Complete	100	0	0	0
epa.gov	Almost Complete	99	1	0	0

Styling

	Status[1]	Pass	Warning	Fail	Missing
choosemyplate.gov	Almost Complete	98	1	1	0
fitness.gov	Almost Complete	99	1	0	0
cdc.gov/oralhealth	Almost Complete	86	13	0	1
womenshealth.gov	Almost Complete	92	7	0	1
mentalhealth.gov	Almost Complete	96	2	1	1
smokefree.gov	Almost Complete	99	1	0	0
drugabuse.gov	Complete	100	0	0	0
cdc.gov/injury	Almost Complete	86	12	1	0
healthcare.gov	Almost Complete	81	18	0	1
epa.gov	Almost Complete	94	5	0	1

HTML Standards

	Status[1]	Pass	Warning	Fail	Missing
choosemyplate.gov	Complete	100	0	0	0
fitness.gov	Partially Implemented	50	0	50	0
cdc.gov/oralhealth	Almost Complete	95	4	1	0
womenshealth.gov	Complete	100	0	0	0
mentalhealth.gov	Partially Implemented	81	10	8	1
smokefree.gov	Almost Complete	97	1	1	1
drugabuse.gov	Complete	100	0	0	0
cdc.gov/injury	Almost Complete	94	4	1	1
healthcare.gov	Almost Complete	56	43	0	1
epa.gov	Almost Complete	54	43	1	2

Note *Complete = 100% Pass + N/A*
Almost Complete = 95-99% Pass + N/A + Warn
Partially Implemented = 40-94% Pass + N/A + Warn

Table 7.
Composite FAE Score by Resource

Resource	Pages Evaluated	% Pass
choosemyplate.gov	110	96.6
fitness.gov	74	82.0
cdc.gov/oralhealth	162	90.0
womenshealth.gov	123	87.8
mentalhealth.gov	147	90.4
smokefree.gov	73	89.6
drugabuse.gov	42	95.2
cdc.gov/injury	155	90.0
healthcare.gov	16	83.6
epa.gov	153	83.2

Table 8.
Composite FAE Best Practices Score Across Resources

Best Practice Category	% Pass
Navigation/Orientation	89.4
Text Equivalents	80.4
Scripting	98.7
Styling	93.1
HTML Standards	82.7

Occurrence of Disability-related Terms. The final analysis completed was the frequency of disability-related terms across all ten resources. Three terms, "disability," "developmental disability," and "intellectual disability" were chosen to measure levels of specificity. The term "disability" covers a wide range of impairments and conditions, the term "developmental disability" refers exclusively to those impairments acquired before the age of 22, and the term "intellectual disability" refers to a developmental disability that significantly impacts cognitive functioning. The terms were searched using the standard search engine installed on each resource. For resources that appeared in other domains (ex. the oral health resource was a subdomain within the CDC's main website),

the term and the resource title (ex. “oral health”) were both input into the search bar. The results of these searches fluctuated greatly between resources. For the term “disability,” *womenshealth.gov* yielded 56,600 results, or 93% of the total occurrences across resources. *Smokefree.gov,* on the other hand, yielded only three of the 60,935 occurrences of the term. Four of the resources (*choosemyplate.gov, fitness.gov, smokefree.gov* and *healthcare.gov*) yielded no results for the term “developmental disability,” whereas *cdc.gov/oralhealth* featured the term thirty-nine times. This accounts for 57.4% of the occurrences of the term across resources. These same four resources also yielded no results for the term “intellectual disability.” Again, *cdc.gov/oralhealth* yielded the most results for this term, accounting for 40.2% (n=33) of the total occurrences of the term across all ten resources. The results are fully summarized in Table 9.

Table 9.
Frequency of I/DD-Related Terms by Resource

Resource	"Disability"		"Developmental Disability"		"Intellectual Disability"	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
choosemyplate.gov	5	0.008	0	0	0	0
fitness.gov	8	0.013	0	0	0	0
cdc.gov/oralhealth	1550	2.544	39	57.4	33	40.2
womenshealth.gov	56600	92.886	6	8.8	19	23.2
mentalhealth.gov	5	0.008	3	4.4	1	1.2
smokefree.gov	3	0.005	0	0	0	0
drugabuse.gov	61	0.100	1	1.5	4	4.9
cdc.gov/injury	510	0.837	4	5.9	7	8.5
healthcare.gov	23	0.038	0	0	0	0
epa.gov	2170	3.561	15	22.1	18	22.0
Total	60935	100	68	100	82	100

Discussion and Future Directions

In the digital age, the Internet is becoming an increasingly important source of information, including information pertaining to health. According to Silberg, et al (1997), the increased access to healthcare information provides "seemingly endless opportunities to inform, teach, and connect professionals and patients alike." With this new method of implementation growing in popularity and capability, it is essential to harness the power of the Internet for health promotion. The simple dissemination of health information could drastically impact not only the health of American citizens, but also healthcare costs attributed to preventable secondary conditions. "A focus on health promotion that leads to an overall healthier population will increase labour force participation rates and labour productivity, thereby improving the wellbeing of [citizens] and putting health care expenditure on a more sustainable path as the population ages" (Murphy, 2005). A 2008 study conducted in the United States found that a small investment in disease prevention and health promotion could lead to significant savings—a $5.60 return for every $1 spent (Trust for America's Health, 2008). This savings is especially important in populations that incur high health costs, including individuals with I/DD. It is predicted that a child born in the year 2000 with a intellectual disability will incur $1,014,000 in healthcare costs throughout their lifetime (Honeycutt, et al, 2004). These costs include conditions attributed to the developmental disability as well as those incurred due to secondary conditions. By contrast, the average American incurs between $268,000 and $316,600 in healthcare costs across a lifetime. These numbers suggests that health promotion regarding the preventable conditions that

disproportionately or particularly affect individuals with I/DD should be both targeted and entirely accessible to as broad a section of the population as possible.

While the web resources analyzed in this study did a fair job providing accessible content, there is still a substantial amount of room for improvement. In particular, it seems that there is work to be done regarding ensuring that images and format are compatible with a whole variety of accessibility technology. As accessibility technology develops and improves, these issues will likely resolve themselves, although the onus should not be on the developers of accessibility technology, but rather the web resource developers. Each resource contained an accessibility statement and, by law, should be adhering to the Section 508 guidelines for web accessibility. Because none of the resources analyzed adhered completely to either the Section 508 or WCAG criteria, it is quite likely that there are individuals with I/DD who are unable to access their materials in a wholly satisfactory manner. Because there are flaws in the accessibility of the health promotion materials presented, individuals are not able to access these materials, and therefore may be suffering from secondary conditions, not receiving preventative healthcare, or being mistreated by the healthcare system because they are unaware of their rights. It is important to note that while these resources adhered fairly well (although not perfectly) to the recommendations and requirements of the W3C and the federal government, they are all resources produced by the federal government. Therefore, they are held to a standard above that of resources produced by non-profits, private corporations, or citizens. There is a wealth of healthcare knowledge on the Internet that is not required to follow accessibility guidelines, and thus may by systematically excluding individuals with developmental disabilities. An analysis of resources produced by

programs and people outside the restriction of the federal government may reveal a greater discrepancy in accessibility, and therefore a greater opportunity to increase health education for individuals with I/DD and close the health gap.

Perhaps of more interest than the tangible accessibility errors found across the resources is the *lack* of tailoring to the needs and issues of individuals with I/DD. Of the 1,055 pages analyzed for this study, the term "developmental disability" only appeared 68 times, and the term "intellectual disability" was written a mere 82 times. It is clear from the literature that the issues addressed by these resources affect the population with I/DD in great numbers, and yet there was very little written about or for these populations. There did not appear to be any linked resources specifically targeting individuals with I/DD, and the material presented on several of the resources may have been at a reading level that is inaccessible to these individuals. Considering the massive difference in healthcare costs across a lifetime between individuals with I/DD and the typical population, it would be of interest to the healthcare community and the federal government (which funds a large portion of the healthcare costs associated with individuals with I/DD) to create content that is specific and targeted toward individuals with I/DD. The population faces health disparities at alarming levels, and the ten issues addressed above are of particular concern to this population. By failing to address the population with I/DD in these resources, the federal health programs may be systematically excluding these individuals from preventative care, which ultimately leads to an increased occurrence of preventable secondary conditions, higher healthcare costs, and lower quality of life. If one were to create content specifically aimed at adults with

I/DD, there may be increased traffic from these individuals, which would in turn disseminate more information to an at-risk population.

There were several limitations to this study, and future research is required to fully gauge the accessibility of online government healthcare resources for adults with I/DD. First, the study was conducted using two pre-existing software programs to analyze accessibility as compared to accepted accessibility standards. These programs were both initially created for research purposes, but focus fully on adherence to the accessibility standards currently in practice rather than practical accessibility. To overcome this limitation, one would need to create an analysis that addressed both qualitative and quantitative accessibility concerns and used human judgment to determine the accessibility of the language, photos, and other content. To determine if individuals with I/DD are being marginalized via content rather than technology requires extensive study. An exploration of the inclusion of individuals with I/DD in photos, examples, and content providers could be of value. Secondly, as previously mentioned, the analysis of the level of language used by each site was beyond the scope of this research. It is important to ensure that not only is the content presented accessible from a technological standpoint, but a cognitive one as well. To determine if the technical language and advanced reading levels used by many of these resources is accessible would further the knowledge base needed to ensure health promotion materials are reaching this population. Finally, the analysis completed in this study only covered resources produced and funded by the US government. It would be of value to compare and contrast the accessibility of these web resources with resources produced by other sources in order to gauge what sector is most successfully reaching individuals with I/DD, where major discrepancies are, and if

federal requirements need to be placed on third sector and private resources to ensure accessibility.

Ultimately, this study has found that online federal resources addressing major preventative health concerns often experienced by individuals with developmental disabilities have navigated the area of technological accessibility fairly well. The format appears to be largely accessible, although areas of concern include images, HTML standards, and ensuring that structural elements are compatible with accessibility software and techniques used by individuals with I/DD. Collectively, however, these resources are not actively addressing the population with I/DD, and therefore may be limiting the reach of the health promotion materials presented. By increasing the accessibility *and* specificity of online health promotion materials regarding the preventable conditions that prove costly and oftentimes deadly for individuals with I/DD, the federal agencies responsible for disseminating this information may save billions of dollars in healthcare costs—including federal aid—and significantly increase the quality of life for millions of individuals with intellectual and developmental disabilities around the country.

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Appendices

Appendix A: FAE Rules Summary

Navigation and Orientation.

Titles (title & h1)

- The page must contain exactly one **title** element.
- The **title** element must have text content.
- The page must contain at least one **h1** element.
- The page should contain no more than two **h1** elements.
- The text content of each **h1** element should match all or part of the **title** content.

The matching algorithm for this rule includes the **alt** text of any **img** elements the **h1** may contain, and ignores case, punctuation and spacing in the text content of both the **title** and **h1** elements.

- Each **h1** element must have text content.

Attribution of text content to an **h1** element includes the **alt** attribute values of any **img** elements it may contain, inserted in document order.

- Each **h1** element should have text content exclusive of the **alt** text of any **img** elements it contains.

Subheadings (h2..h6)

- Subheading elements that follow the last **h1** should be properly nested.

Subheading elements should be used without skipping levels when descending through the sublevels **h2**..**h6**. For example, an **h2** element should follow an **h1** element, an **h3** element should follow an **h2** element, and so on. Note that this rule does not apply to subheadings of the same level (for example, an **h3** may follow another **h3**), or when ascending the hierarchy (an **h2** may follow an **h4**).

- Each subheading element (**h2**..**h6**) must have text content.

Attribution of text content to a subheading element includes the **alt** attribute values of any **img** elements it may contain, inserted in document order.

- Each subheading element (**h2**..**h6**) should have text content exclusive of the **alt** text of any **img** elements it contains.

Navigation Bars

- Each **ul** or **ol** element that precedes the last **h1** element and appears to be a navigation bar should be immediately preceded by a heading element, preferably an **h2**.

FAE considers a **ul** or **ol** element to be a navigation bar if it appears to be a navigation list, defined recursively as follows. A navigation list is a **ul** or **ol** element that contains one or more "item with link" **li** elements, and no more than one **li**element that does not qualify as an "item with link". An "item with link" is defined as an **li** element that contains either a single text link (**a** element) or a link followed by a nested navigation list, optionally preceded by a heading element.

- Each **map** element that precedes the last **h1** element and appears to be a navigation bar should be immediately preceded by a heading element, preferably an **h2**

FAE considers a **map** element to be a navigation bar if it contains one or more **area** elements.

- Each **area** element should have a redundant text link (**a** element) with matching **href** value.

Form Control Labels

- Each **input** element with **type=text** | **password** | **checkbox** | **radio** | **file** and each **select** and **textarea** element must either be referenced by the **for** attribute of a **label** element via its **id** attribute, or have a **title** attribute.

Label referencing is implemented by setting the **label** element's **for** attribute value equal to that of the **form** control's **id** attribute.

- Each **input** element with **type=button** | **submit** | **reset** must have either a **value** attribute or a **title** attribute.
- Each **input** element with **type=image** must have either an **alt** attribute or a **title** attribute.
- Each **label** and **legend** element must have text content.
- If an **input**, **select**, **textarea** or **button** element has an **id** attribute, its value must be unique relative to all **id**s on the page.

Data Tables

To qualify as a data table, the **table** element must (a) contain at least two rows and two columns and (b) have or contain at least one of the following: a **summary** attribute; a **caption** element; a **thead** element; a **th** element; or a **td** element with a **scope** or **headers** attribute.

To qualify as a complex data table, the **table** element must (a) qualify as a data table and (b) contain any of the following: a **thead** element that contains two or more **tr** elements; a **tr** element with a **td** or **th** element with a **rowspan** or**colspan** attribute value greater than 1; a **tr** element that contains at least one **td** element and two or more **th** elements; two or more **tr** elements that contain only **th** elements; a **tr** element with a **td** or **th** element with a **headers** attribute value that contains more than two **IDREF**s.

- Each data table must include column and/or row headers: The first cell in each column must be a **th** element, and/or each row must contain at least one **th** element.
- Each data table must have a nonempty **summary** attribute.
- The **summary** attribute value for each data table on a page should be unique.

Uniqueness comparisons are case-insensitive and performed on whitespace-normalized attribute values.

- Each **th** element in a complex data table must have an **id** attribute whose value is unique relative to all **id**s on the page.
- Each **td** element in a complex data table must have a **headers** attribute that references the **id** attributes of associated **th** elements.

Default Language

- Each page must have a **lang** attribute on its **html** element whose value or initial subtag is a valid two-character language code.

Valid two-character language codes are defined in the IANA Language Subtag Registry. If the **lang** attribute value is hyphenated, then the substring preceding the first hyphen is tested for validity.

Access Keys

- Each **accesskey** attribute value on a page should be unique.

Frames

- Each **frame** element must have a nonempty **title** attribute.
- The **title** attribute value for each **frame** element within a **frameset** must be unique.

Uniqueness comparisons are case-insensitive and performed on whitespace-normalized attribute values.

Text Equivalents.

Informative Images

- Each img element must have an alt attribute.

Decorative Images

- Each img element with an empty alt attribute should be removed; CSS techniques should be used instead.
- Each img element with width or height less than 8 pixels should be removed; CSS techniques should be used instead.

Image Maps

- Each area element must have an alt attribute.

Scripting.

Focusable elements are primarily links and form controls. Specifically, they include the a element with an href attribute and/or a tabindex attribute with a value of 0 or greater, and the area, button, input, select and textarea elements.

onclick

- The onclick attribute should not be used on elements that cannot accept keyboard focus.

onmouseover & onmouseout

- Each focusable element with an onmouseover attribute should also have an onfocus attribute, and their associated event handlers should trigger the same or similar actions.
- Each focusable element with an onmouseout attribute should also have an onblur attribute, and their associated event handlers should trigger the same or similar actions.
- The onmouseover and onmouseout attributes should not be used on elements that cannot accept keyboard focus; use CSS techniques instead to provide the desired stylistic effects.

Styling.

Text Styling

- The font and center elements should not be used. Instead use structural markup with CSS for styling.
- The b element should not be used for bold styling of text content. Instead use heading elements h1..h6 for heading text or the strong element for emphasizing words, phrases or sentences.
- The i element should not be used to italicize text content. Instead use heading elements h1..h6 for heading text or the em element for emphasizing words, phrases or sentences.
- The u element should not be used to underline text content. Instead use heading elements h1..h6 for heading text or the em or strong elements for emphasizing words, phrases or sentences.
- The blink and marquee elements must not be used.

Blinking or moving text causes accessibility problems for people with photosensitive epilepsy and visual impairments.

Layout Tables

- Tables should be used only for organizing data in rows and columns. Use CSS instead of tables and nested tables to visually layout blocks of related content for graphical rendering.

The existence of deeply nested tables suggests that tables are being used for page layout. Nested tables can cause readability problems when a page is linearized.

HTML Standards.

W3C Specifications

- Each page must include a DOCTYPE declaration to facilitate rendering and validation.
- The character encoding of each page should be specified within the value of the content attribute (using charset=) on a meta element that also includes an http-equiv attribute set to "content-type".

For example, if the character encoding is UTF-8, it could be specified in XHTML with: <meta http-equiv="content-type" content="text/html; charset=UTF-8"/>

Appendix B: FAE Reports

Choosemyplate.gov

Summary Report

Nutrition
Pages: 110 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www.choosemyplate.gov/

Evaluation Results by Best Practices Main Category

Category	Status [1]	% Pass	% Warn	% Fail
Navigation & Orientation	Partially Implemented	86	6	7
Text Equivalents	Almost Complete	99	0	1
Scripting	Complete	100	0	0
Styling	Almost Complete	98	1	1
HTML Standards	Complete	100	0	0

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	84	11	4
Subheadings (h2..h6)	79	1	20
Navigation Bars	71	28	0
Form Control Labels	80	0	19
Data Tables	96	1	3
Default Language	99	0	1
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	96	0	3
Decorative Images	100	0	0
Image Maps	100	0	0
Scripting			
onclick	100	0	0
onmouseover & onmouseout	100	0	0
Styling			
Text Styling	98	1	0
Layout Tables	99	0	1
HTML Standards			
W3C Specifications	100	0	0

Note: % Pass includes N/A results.

Fitness.gov.

Summary Report

Fitness
Pages: 74 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www.fitness.gov/

Evaluation Results by Best Practices Main Category

Category	Status [1]	% Pass	% Warn	% Fail
Navigation & Orientation	Almost Complete	91	4	3
Text Equivalents	Almost Complete	70	23	5
Scripting	Complete	100	0	0
Styling	Almost Complete	99	1	0
HTML Standards	Partially Implemented	50	0	50

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	97	2	0
Subheadings (h2..h6)	65	1	33
Navigation Bars	66	33	0
Form Control Labels	100	0	0
Data Tables	99	0	1
Default Language	100	0	0
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	78	0	21
Decorative Images	52	47	0
Image Maps	100	0	0
Scripting			
onclick	100	0	0
onmouseover & onmouseout	100	0	0
Styling			
Text Styling	99	1	0
Layout Tables	100	0	0
HTML Standards			
W3C Specifications	50	0	50

Note: % Pass includes N/A results.

Womenshealth.gov.

Summary Report

Women's Health
Pages: 123 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www.womenshealth.gov/

Evaluation Results by Best Practices Main Category

Category	Status [1]	% Pass	% Warn	% Fail
Navigation & Orientation	Partially Implemented	85	4	9
Text Equivalents	Almost Complete	72	27	1
Scripting	Almost Complete	90	9	0
Styling	Almost Complete	92	7	0
HTML Standards	Complete	100	0	0

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	95	4	0
Subheadings (h2..h6)	97	1	2
Navigation Bars	67	32	0
Form Control Labels	79	0	20
Data Tables	89	1	10
Default Language	1	0	98
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	97	0	2
Decorative Images	45	54	0
Image Maps	100	0	0
Scripting			
onclick	99	1	0
onmouseover & onmouseout	86	13	0
Styling			
Text Styling	92	7	0
Layout Tables	90	9	0
HTML Standards			
W3C Specifications	100	0	0

Note: % Pass includes N/A results.

Cdc.gov/oralhealth.

Summary Report

Dental Health
Pages: 162 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www.cdc.gov/oralhealth/

Evaluation Results by Best Practices Main Category

Category	Status [1]	% Pass	% Warn	% Fail
Navigation & Orientation	Almost Complete	91	3	5
Text Equivalents	Almost Complete	79	20	1
Scripting	Almost Complete	99	1	0
Styling	Almost Complete	86	13	0
HTML Standards	Almost Complete	95	4	1

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	89	7	2
Subheadings (h2..h6)	67	1	32
Navigation Bars	89	10	0
Form Control Labels	97	0	2
Data Tables	98	1	1
Default Language	96	0	3
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	98	0	1
Decorative Images	59	40	0
Image Maps	100	0	0
Scripting			
onclick	99	1	0
onmouseover & onmouseout	99	1	0
Styling			
Text Styling	84	15	0
Layout Tables	97	2	0
HTML Standards			
W3C Specifications	95	4	1

Note: % Pass includes N/A results.

Mentalhealth.gov

Summary Report

Mental Health
Pages: 147 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www.mentalhealth.gov/

Evaluation Results by Best Practices Main Category

Category	Status [1]	% Pass	% Warn	% Fail
Navigation & Orientation	Almost Complete	89	7	2
Text Equivalents	Almost Complete	86	9	4
Scripting	Complete	100	0	0
Styling	Almost Complete	96	2	1
HTML Standards	Partially Implemented	81	10	8

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	79	16	3
Subheadings (h2..h6)	98	0	1
Navigation Bars	73	26	0
Form Control Labels	98	0	1
Data Tables	99	0	1
Default Language	59	0	40
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	82	0	17
Decorative Images	80	19	0
Image Maps	100	0	0
Scripting			
onclick	100	0	0
onmouseover & onmouseout	100	0	0
Styling			
Text Styling	96	3	0
Layout Tables	97	0	2
HTML Standards			
W3C Specifications	81	10	8

Smokefree.gov

Summary Report

Tobacco Cessation
Pages: 73 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www.smokefree.gov/

Evaluation Results by Best Practices Main Category

Category	Status [1]	% Pass	% Warn	% Fail
Navigation & Orientation	Almost Complete	94	4	1
Text Equivalents	Almost Complete	58	40	1
Scripting	Complete	100	0	0
Styling	Almost Complete	99	1	0
HTML Standards	Almost Complete	97	1	1

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	95	2	1
Subheadings (h2..h6)	94	0	5
Navigation Bars	68	31	0
Form Control Labels	99	0	1
Data Tables	98	1	1
Default Language	98	0	1
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	98	0	1
Decorative Images	18	81	0
Image Maps	100	0	0
Scripting			
onclick	100	0	0
onmouseover & onmouseout	100	0	0
Styling			
Text Styling	99	1	0
Layout Tables	100	0	0
HTML Standards			
W3C Specifications	97	1	1

Note: % Pass includes N/A results.

Drugabuse.gov.

Summary Report

Substance Abuse
Pages: 42 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www.drugabuse.gov/

Evaluation Results by Best Practices Main Category

Category	Status [1]	% Pass	% Warn	% Fail
Navigation & Orientation	Almost Complete	91	4	3
Text Equivalents	Almost Complete	85	14	0
Scripting	Complete	100	0	0
Styling	Complete	100	0	0
HTML Standards	Complete	100	0	0

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	98	1	1
Subheadings (h2..h6)	99	0	1
Navigation Bars	67	32	0
Form Control Labels	99	0	1
Data Tables	76	5	18
Default Language	100	0	0
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	100	0	0
Decorative Images	71	28	0
Image Maps	100	0	0
Scripting			
onclick	100	0	0
onmouseover & onmouseout	100	0	0
Styling			
Text Styling	100	0	0
Layout Tables	100	0	0
HTML Standards			
W3C Specifications	100	0	0

Note: % Pass includes N/A results.

Cdc.gov/injury.

Summary Report

Violence and Injury
Pages: 155 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www.cdc.gov/injury

Evaluation Results by Best Practices Main Category

Category	Status	% Pass	% Warn	% Fail
Navigation & Orientation	Almost Complete	91	3	5
Text Equivalents	Almost Complete	80	19	1
Scripting	Almost Complete	99	1	0
Styling	Almost Complete	86	12	1
HTML Standards	Almost Complete	94	4	1

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	88	9	2
Subheadings (h2..h6)	67	1	32
Navigation Bars	86	13	0
Form Control Labels	97	0	2
Data Tables	99	0	1
Default Language	96	0	3
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	98	0	1
Decorative Images	61	38	0
Image Maps	100	0	0
Scripting			
onclick	99	1	0
onmouseover & onmouseout	99	1	0
Styling			
Text Styling	84	15	0
Layout Tables	98	1	1
HTML Standards			
W3C Specifications	94	4	1

Note: % Pass includes N/A results.

Healthcare.gov.

Summary Report

Healthcare Access
Pages: 16 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www.healthcare.gov/

Evaluation Results by Best Practices Main Category

Category	Status [1]	% Pass	% Warn	% Fail
Navigation & Orientation	Partially Implemented	86	5	8
Text Equivalents	Almost Complete	96	3	0
Scripting	Complete	100	0	0
Styling	Almost Complete	81	18	0
HTML Standards	Almost Complete	56	43	0

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	90	8	1
Subheadings (h2..h6)	91	0	8
Navigation Bars	68	31	0
Form Control Labels	62	0	37
Data Tables	100	0	0
Default Language	100	0	0
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	100	0	0
Decorative Images	93	6	0
Image Maps	100	0	0
Scripting			
onclick	100	0	0
onmouseover & onmouseout	100	0	0
Styling			
Text Styling	77	22	0
Layout Tables	100	0	0
HTML Standards			
W3C Specifications	56	43	0

Note: % Pass includes N/A results.

Epa.gov.

Summary Report

Environmental Quality
Pages: 153 Depth: 3rd-level Span: Next-level subdomains Ruleset: 1011-1 (current)
URL: http://www2.epa.gov/learn-issues/learn-about-health-and-safety

Evaluation Results by Best Practices Main Category

Category	Status	% Pass	% Warn	% Fail
Navigation & Orientation	Almost Complete	90	4	4
Text Equivalents	Almost Complete	79	19	1
Scripting	Almost Complete	99	1	0
Styling	Almost Complete	94	5	0
HTML Standards	Almost Complete	54	43	1

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	90	6	2
Subheadings (h2..h6)	78	1	20
Navigation Bars	71	28	0
Form Control Labels	97	0	2
Data Tables	97	0	2
Default Language	92	0	7
Access Keys	100	0	0
Frames	100	0	0
Text Equivalents			
Informative Images	96	0	3
Decorative Images	61	38	0
Image Maps	100	0	0
Scripting			
onclick	100	0	0
onmouseover & onmouseout	99	1	0
Styling			
Text Styling	93	6	0
Layout Tables	98	1	0
HTML Standards			
W3C Specifications	54	43	1

Note: % Pass includes N/A results.